

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

LAMBETH MAGNETIC STRUCTURES,))	
LLC,)	
)	
Plaintiff,)	Civil Action No. 16-538
)	
v.)	Judge Cathy Bissoon
)	
SEAGATE TECHNOLOGY (US))	
HOLDINGS, INC., <i>et al.</i> ,)	
)	
Defendants.)	

LAMBETH MAGNETIC STRUCTURES,))	
LLC,)	
)	
Plaintiff,)	Civil Action No. 16-541
)	
v.)	Judge Cathy Bissoon
)	
WESTERN DIGITAL CORPORATION,)	
<i>et al.</i> ,)	
)	
Defendants.)	

MEMORANDUM ORDER

These are patent infringement cases in which Plaintiff Lambeth Magnetic Structures, LLC, alleges, in two separate civil action numbers, 16-538 and 16-541 respectively, that Seagate Technology (US) Holdings and Seagate Technology, LLC (collectively, the “Seagate Defendants” or “Seagate”); and Western Digital Corporation, Western Digital Technologies, Inc., Western Digital (Fremont), LLC, Western Digital (Thailand) Company Limited, Western Digital (Malaysia) SDN.BHD and HGST, Inc. (collectively the “Western Digital Defendants” or “Western Digital”) infringe Plaintiff’s patent, United States Patent No. 7,128,988 (the “‘988 patent”).

In each action, the parties filed a Joint Disputed Claim Terms Chart identifying the six terms requiring construction. Chart Setting Forth Each Disputed Term (Civil Action No. 16-538, Doc. 46-1); Am. Joint Disputed Claim Terms Chart (Civil Action No. 16-541, Doc. 60-1).

On March 20, 2017, the parties presented a technology tutorial to the Court. The following day, March 21, 2017, the Court held a Markman claim construction hearing.¹ See Claim Construction Hearing Transcript (Civil Action No. 16-538, Doc. 73; Civil Action No. 16-541, Doc. 78) [hereinafter “Hearing Transcript”]. The matters were consolidated for purposes of the claim construction hearing.

Legal Standard

The general principles of claim construction are without dispute. The proper construction of a patent’s claims is a question of law. Teva Pharm. USA, Inc. v. Sandoz, Inc., 135 S.Ct. 831, 837 (2015) (citing Markman v. Westview Instruments, Inc., 517 U.S. 370, 388-91 (1996)). “It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1115 (Fed. Cir. 2004)). The words of a claim “are generally given their ordinary and

¹ These two actions were preceded by a third civil action, Lambeth Magnetic Structures, LLC, v. Toshiba Corporation, et al., 14-1526. All three civil actions were consolidated for purposes of claim construction. The Defendants in the Toshiba Corporation action (“the Toshiba Defendants” or “Toshiba”) fully briefed claim construction and participated fully in the Technology Tutorial and Markman hearing. Plaintiff dismissed its action against the Toshiba Defendants shortly thereafter. See Order Approving Stipulation of Dismissal (Civil Action No. 14-1526, Doc. 180). Given the Toshiba Defendants’ involvement, the Court has chosen, where relevant, to refer to their proposed constructions and reasoning. To distinguish between the Toshiba Defendants and the active Defendants, the Court refers herein to Seagate and Western Digital, collectively, as “remaining Defendants.”

customary meaning,” which “is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” Id. at 1312-13 (citing Vitronics Corp. v. Conceptor, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)); Innova/Pure Water, 381 F.3d at 1116). In arriving at this meaning, a court is to look first and foremost to the “intrinsic evidence,” which consists of the patent’s claim language, the specification and written description, and the prosecution history, to determine the meaning of disputed claim terms. Phillips, 415 F.3d at 1311-17; Medrad, Inc. v. MRI Devices Corp., 401 F.3d 1313, 1319 (Fed. Cir. 2005). The specification is the single best guide to the meaning of a disputed term, and is “usually...dispositive.” Phillips, 415 F.3d at 1315 (citing Vitronics, 90 F.3d at 1582).

Claim language guides a court’s construction of claim terms. Phillips, 415 F.3d at 1314. Yet, the “claims cannot enlarge what is patented beyond what the inventor has described as the invention.” Abbott Laboratories v. Sandoz, Inc., 566 F.3d 1282, 1288 (Fed. Cir. 2009) (citing Biogen, Inc. v. Berlex Labs., Inc., 318 F.3d 1132, 1140 (Fed. Cir. 2003)). The context in which a term is used not only in the asserted claims, but also in any claims that are not being asserted in a particular lawsuit, can be highly instructive because “terms are normally used consistently throughout the patent.” Phillips, 415 F.3d at 1314. “The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” Renishaw PLC v. Marposs Societa per Azioni, 158 F.3d 1243, 1250 (Fed. Cir. 1998).

Claims are always to be read in view of the specification, of which they are a part. Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), aff’d, 517 U.S. 370 (1996). “The person of ordinary skill in the art is deemed to read the claim term not

only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” Phillips, 415 F.3d at 1313. Moreover, “where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone[,]” the specification can provide clarity. Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1325 (Fed. Cir. 2002). In the specification, a patentee may define his own terms, or give a claim term a different meaning than it otherwise would possess. Id. at 1316. Although a court generally presumes that terms possess their ordinary meaning, this presumption can be overcome when the patentee acts as his own lexicographer. Irdeeto Access, Inc. v. EchoStar Satellite Corp., 383 F.3d 1295, 1301 (Fed. Cir. 2004).

“Although the specification may aid the court in interpreting the meaning of disputed language in the claims, particular embodiments and examples appearing in the specification will not generally be read into the claims.” Constant v. Advanced Micro-Devices, Inc., 848 F.2d 1560, 1571 (Fed. Cir. 1988); see Phillips, 415 F.3d at 1323. Nonetheless, “[a] claim interpretation that excludes a preferred embodiment from the scope of the claim ‘is rarely, if ever, correct.’” Globetrotter Software, Inc. v. Elam Computer Grp. Inc., 362 F.3d 1367, 1381 (Fed. Cir. 2004) (quoting Vitronics Corp., 90 F.3d at 1583). Even if a patent describes only a single embodiment, the claims of the patent must not be construed as being limited to that embodiment unless the patentee has demonstrated a clear intention to limit the claim scope using “words or expressions of manifest exclusion or restriction.” Phillips, 415 F.3d at 1323; Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 906 (Fed. Cir. 2004) (citing decisions); Teleflex, 299 F.3d at 1327. The purpose of the specification is “to teach and enable those of skill in the art

to make and use the invention” and sometimes, the best way to do that is to provide an example. Teleflex, 299 F.3d at 1327.

Although the Court of Appeals for the Federal Circuit acknowledges that “the distinction between using the specification to interpret the meaning of a claim and importing limitations from the specification into the claim can be a difficult one to apply in practice,” it instructs courts to maintain their focus on how a person of ordinary skill in the art would understand the claim terms. Id. In order to do so, the “claims of the patent must be read in light of the specification’s consistent emphasis on [the] fundamental features of the invention.” Praxair, Inc. v. ATMI, Inc., 543 F.3d 1306, 1324 (Fed. Cir. 2008).

The prosecution history is another tool that supplies the proper context for claim construction. Home Diagnostics Inc. v. LifeScan, Inc., 381 F.3d 1352, 1356 (Fed. Cir. 2004). Because the file history “represents an ongoing negotiation between the [United States Patent and Trademark Office (“PTO”)] and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful in claim construction proceedings.” Phillips, 415 F.3d at 1317. Nevertheless, the prosecution history is intrinsic evidence that is relevant to the determination of how the inventor understood the invention and whether the inventor limited the invention during prosecution by narrowing the scope of the claims. Id. Where an applicant limits claim scope during prosecution through a “clear disavowal of claim coverage, such as an amendment to overcome a rejection,” the well-established doctrine of prosecution disclaimer “preclud[es] patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution.” Amgen Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1327 (Fed. Cir. 2003) (citing York Prods., Inc. v. Central Tractor Farm & Fam. Ctr., 99 F.3d 1568, 1575 (Fed. Cir. 1996)); see Omega Eng’g Inc. v.

Raytek Corp., 334 F.3d 1314, 1323 (Fed. Cir. 2003). By distinguishing the claimed invention over the prior art, an applicant is indicating what the claims do not cover. Spectrum Int'l v. Sterilite Corp., 164 F.3d 1372, 1378-79 (Fed. Cir. 1988) (quotation omitted). In order for the doctrine to apply, however, the prosecution history must show that the patentee clearly, unambiguously and unmistakably disclaimed or disavowed the proposed interpretation during prosecution in order to obtain claim allowance. Schindler Elevator Corp. v. Otis Elevator Co., 593 F.3d 1275, 1285 (Fed. Cir. 2010); Cordis Corp. v. Medtronic AVE, Inc., 339 F.3d 1352, 1358 (Fed. Cir. 2003); Middleton Inc. v. 3M Co., 311 F.3d 1384, 1388 (Fed. Cir. 2002).

Phillips rejected any claim construction approach that sacrificed the intrinsic record in favor of extrinsic evidence, such as dictionary definitions or expert testimony. Phillips, 415 F.3d at 1319-24. Still, though “less significant than the intrinsic record in determining the legally operative meaning of claim language,” a court may rely on extrinsic evidence to “shed useful light on the relevant art.” Id. at 1317 (quotation omitted). Technical dictionaries and treatises may help the court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but such sources may also provide overly broad definitions or may not be indicative of how terms are used in the patent. Id. at 1318. Similarly, expert testimony may aid the court in determining the particular meaning of a term in the pertinent field, but “conclusory, unsupported assertions by experts as to the definition of a claim term are not useful.” Id. Generally, extrinsic evidence is “less reliable than the patent and its prosecution history in determining how to read claim terms.” Id.

Undisputed Claim Terms

Before proceeding to resolving the disagreements with respect to the disputed claim terms, the Court notes that the parties have agreed to the construction of two claim terms. They are as follows:

Undisputed Claim Term	Agreed-Upon Proposed Construction
“bcc-d”	Either a body centered cubic or a body centered cubic derivative crystal structure.
“fcc-d”	Either a face centered cubic or a face centered cubic derivative crystal structure.

The Court, agreeing with the parties’ proposed constructions, adopts the agreed-upon constructions without change. The Court finds that these constructions are supported by the specification. E.g., ‘988 patent at col. 4, lns. 44-45; id. at col. 5, lns.12-13.

Disputed Claim Terms

The parties have asked the Court to construe six disputed claim terms. These terms are:

Number	Term
1	“Atomic template”
2	“[Layer] providing a (111) textured hexagonal atomic template”
3	“Uniaxial”
4	“Symmetry broken structure”
5	“Uniaxial symmetry broken structure”
6	“Variant/orientational variant” and “variants/orientational variants”

As the Court will explain in greater detail below, the Court will adopt the following constructions for the disputed terms:

Number	Term	Construction
1	“Atomic template”	An atomic pattern upon which material is grown and which is used to direct the growth of an overlying layer
2	“[Layer] providing a (111) textured hexagonal atomic template”	Layer that is predominately (111) hexagonal and that provides an atomic template
3	“Uniaxial”	Having an anisotropy energy density function with only a single maximum and a single minimum as the magnetization angle is rotated by 180 degrees from a physical axis
4	“Symmetry broken structure”	A structure consisting of unequal volumes or unequal amounts of the bcc-d variants of a six variant system
5	“Uniaxial symmetry broken structure”	A structure that is uniaxial as a result of the structure being symmetry broken
6	“Variant/orientational variant”	One of a set of possible crystal orientations
	“Variants/orientational variants”	Two or more of a set of possible crystal orientations

1. Atomic template²

The Court finds that the appropriate construction of “atomic template” is “an atomic pattern upon which material is grown and which is used to direct the growth of an overlying layer.”

As noted in the chart below, the Seagate and Western Digital Defendants’ proposed constructions are identical.

² This term appears in all asserted claims other than claim 17.

Claim Term	Lambeth's Proposal	Seagate's Proposal	Western Digital's Proposal	Toshiba's Proposal [action dismissed]
"Atomic template"	An underlying pattern of atoms that guides the formation of an overlying layer.	Surface that directs the growth of the bcc-d layer.	Surface that directs the growth of the bcc-d layer.	An atomic pattern upon which a material is grown and which is used to guide the location of the atoms in the material.

The distinctions between Plaintiff's and remaining Defendants' constructions rest on two possible limitations³ proposed by Defendants and the claim construction question for the Court can be stated as two disputes: whether the atomic template consists of only the "surface" as opposed to the "underlying pattern of atoms," and whether the layer that this template causes to form must be "the bcc-d layer" or may be "an overlying layer" in the material.

Concerning the first limitation, the Court finds no basis in the intrinsic or extrinsic evidence to restrict the meaning of "atomic template" to the atoms in, or adjacent to, the "surface." Defendants argue that term "surface," which "include[s] the top layer of atoms" and perhaps immediate additional layers, Hearing Transcript at 35, lns. 19-23, is present in the '988 patent and adds clarity to the meaning of "atomic template," which could otherwise refer to atoms present anywhere in a layer of the structure. Western Digital's Responsive Claim Construction Brief (Civil Action No. 16-541, Doc. 61) at 4; Seagate's Response to Plaintiff's

³ While the briefing includes a third dispute as to "guides the formation" versus "directs the growth," e.g., Seagate's Response to Plaintiff's Opening Claim Construction Brief (Civil Action No. 16-538, Doc. 56) at 4, Plaintiff's arguments during the Markman hearing revealed that its objection to "directs the growth" primarily concerned Toshiba's proposed construction, which refers to guiding "the location of atoms" rather than guiding the overall shape of a layer; Plaintiff's argument does not rest on the distinction between "guides" and "directs." Hearing Transcript at 22, lns. 21-25. In light of Plaintiff's dismissal of its action against Toshiba and this Court's resolution of the remaining disputes, this third dispute is no longer relevant.

Opening Claim Construction Brief (Civil Action No. 16-538, Doc. 56) at 5-7. However, “surface” is not used in the ‘988 patent in the context of defining or describing the term “atomic template” and, as Defendants conceded during the Markman hearing, the patent’s internal logic implies that “there’s more to the atomic template” than the surface. Hearing Transcript at 36, lns. 7-15; see also id. at 41, lns. 1-8.

In the context of the asserted claims, the word “template” has an ordinary meaning that implies a function—influencing the growth of the layers above it. Cf. Detailed Action, Office Action 10/415,757 (Civil Action No. 16-538, Doc. 50-4) [hereinafter “Office Action”] at ¶6 (“The underlying layers appears [sic] to direct the growth of overlying layers in order to achieve the claimed microstructure.”). In construing “atomic template,” the Court need not set a limit on the template’s thickness by using the word “surface.”

Likewise, the patent provides no basis for the second limitation, which would restrict the meaning of “atomic template” to one which specifically directs the growth “of the bcc-d layer” as opposed to “an overlying layer.” As a factual matter, it may be the case that the invention uses an atomic template to control the growth of a bcc-d layer. See ‘988 Patent at col. 12, ln. 66–col. 13, ln. 2 (“this invention deals with a structure to achieve uniaxial magnetocrystalline orientation via the use of the (110) texture of the body centered cubic (bcc) or body centered cubic derivative crystal thin film structures”). However, as a matter of claim construction, there is no reason to restrict the definition as Defendants propose. This is because the patent also implies that atomic templates may exert effects on overlying layers through intervening layers composed of various crystalline structures, including ones that are not bcc-d. E.g., ‘988 patent at col. 10, lns. 15-20 (intervening fcc layer); id. at col. 29, lns. 60-66 (intervening bcc-d layers); id. at col. 30, ln. 63 – col. 31, ln. 3 (intervening bcc-d layers). Restricting the meaning of “atomic

template” to an atomic template that directs the growth of the bcc-d layer would be inconsistent with the role of an atomic template implied throughout the specification. Drawing on the Examiner’s clarification during prosecution,⁴ the atomic template is simply the pattern of atoms upon which material is grown and which is used to direct the growth of an overlying layer in the material. See Office Action at ¶6 (“The underlying layers appears [sic] to direct the growth of overlying layers in order to achieve the claimed microstructure.”).

2. *[Layer] providing a (111) textured hexagonal atomic template*⁵

The second disputed claim term incorporates the first term, “atomic template,” but adds a restricting adjectival phrase, “(111) textured hexagonal.”⁶ For the reasons stated below, the Court finds that the appropriate construction of “[layer] providing a (111) textured hexagonal atomic template” is “layer that is predominately (111) hexagonal and that provides an atomic template.”

The parties’ proposed constructions for this claim term are provided in the chart below:

⁴ This description was subsequently adopted by the applicant. See Lambeth’s Opening Claim Construction Brief (Civil Action No. 16-538, Doc. 50) at 3.

⁵ This term appears in all asserted claims except claim 17.

⁶ As shown in the proposed construction chart for this term, the meanings of “layer” and “providing” are not disputed.

Claim Term	Lambeth's Proposal	Seagate's Proposal	Western Digital's Proposal	Toshiba's Proposal [action dismissed]
“[Layer] providing a (111) textured hexagonal atomic template”	Providing an atomic template having a close packed hexagonal pattern of atoms formed from a (111) plane of fcc-d material or a (0002) plane of hcp material.	Layer providing a predominantly (111) hexagonal surface that directs the growth of the bcc-d crystals of the bcc-d layer.	Layer providing a predominantly (111) hexagonal surface that directs the growth of the bcc-d crystals of the bcc-d layer.	Providing a (111) textured hexagonal atomic template to the bcc-d layer.

As explained below, the word “textured” is the only remaining term for the Court to construe in the second disputed claim. A person of ordinary skill in the art would recognize the meaning of (111) hexagonal in the context of magnetic material structures, as this refers to a geometric plane in a commonly used coordinate system for describing the location of a layer within a crystalline structure. See, e.g., ‘988 patent at col. 10, lns. 35-42 (referring to the (110) plane and the (111) plane, and noting that “[t]hese crystalline planes and crystalline directions are illustrated in FIG. 3,” which depicts crystal orientations on these planes in relation to each other and illustrates the hexagonal pattern of atoms on the (111) plane); id. at col. 15, lns. 5-9 (referring to the “(111) plane of atoms” and the “(111) atomic crystal planes” of crystal lattices); Hearing Transcript at 77, ln. 19 (“(111) refers to a plane” (statement by counsel for Plaintiff)); id. at 85, lns. 23-25 (“we think there is no dispute that people of skill in the art would know what (111) hexagonal is” (statement by counsel for Western Digital)). The inventor has not provided a definition that would supplant the ordinary meaning of this term. No further construction of (111) hexagonal is necessary. This Court has already construed the meaning of “atomic template” in the context of the asserted claims, above. As a result, the only remaining term for this Court to construe within the second disputed claim is the word “textured.”

Fortunately, the inventor has acted as his own lexicographer in this instance and provided a definition of this term in United States Patent No. 6,248,416 (the “‘416 patent”), which is incorporated by reference in the ‘988 patent. ‘988 patent at col. 9, lns. 48-49. The ‘416 patent defines “texture” as follows:

The predominate crystallographic orientation of a layer is known as the crystallographic texture, or texture, as used herein, as opposed to the use of the term “texture” to describe the mechanical roughness of a surface.

‘416 patent at col. 2, lns. 36-40. In the disputed claim, as noted above, “(111) hexagonal” describes the crystallographic orientation of the referenced layer. The term “textured,” in this context, thus indicates that “(111) hexagonal” is the predominate crystallographic orientation of the layer.

Plaintiff’s and Defendants’ proposed additions to this construction are rejected. Plaintiff would add that such a layer must have “a close packed hexagonal pattern of atoms formed from a (111) plane of fcc-d material or a (0002) plane of hcp material.” The patent explicitly states that these formations are both “examples of the (111) textured hexagonal atomic template.” ‘988 patent at col. 14, lns. 55-59.⁷ The two close packed hexagonal structures mentioned in Plaintiff’s construction are examples of the claim term, not its definition. Defendants’ arguments supporting their proposed limitations to this term, which refer to bcc-d crystals and the bcc-d layer, rehash their construction arguments for the term “atomic template” and are rejected for the same reasons.

⁷ The Court also notes that claim 6 states a dependent claim that adds the following limitation to a structure containing a (111) textured hexagonal atomic template: “wherein the layer providing said hexagonal atomic template is formed from a fcc-d or hcp crystalline material.” ‘988 patent at col. 45, lns. 21-23. This limitation provides further support that Plaintiff’s additions are unwarranted.

3. *Uniaxial*⁸

The third disputed claim term, “uniaxial,” is defined by the inventor in the ‘988 patent as follows:

Here, we define “uniaxial” anisotropy to exist if the anisotropy energy density function only contains a single maximum and a single minimum as the magnetization angle, θ , is rotated by 180 degrees from a physical axis.

‘988 patent at col. 1, lns. 56-60. The Court finds that the appropriate construction of “uniaxial” is “having an anisotropy energy density function with only a single maximum and a single minimum as the magnetization angle is rotated by 180 degrees from a physical axis” because the inventor’s definition in the ‘988 patent is dispositive.

Claim Term	Lambeth’s Proposal	Seagate’s Proposal	Western Digital’s Proposal	Toshiba’s Proposal [action dismissed]
“Uniaxial”	Having a single magnetic easy axis and a single magnetic hard axis within a 180 degree rotation.	Having an anisotropy energy density function with only a single maximum (local or global) and a single minimum (local or global) as the magnetization angle is rotated from a physical axis within the (110) plane.	Having an anisotropy energy density function with only a single maximum (local or global) and a single minimum (local or global) as the magnetization angle is rotated by 180 degrees from a physical axis within the layer.	Having an anisotropy energy density function with only a single maximum and a single minimum as the magnetization angle is rotated by 180 degrees from a physical axis.

⁸ This term appears in asserted claims 1, 17 and 27.

Plaintiff alleges that its proposed construction, shown above, is equivalent to the definition provided in the '988 patent and would have the additional virtue of being more understandable for a jury. Hearing Transcript at 117, lns. 1-20. This Court disagrees. Defendants have demonstrated that Plaintiff's construction is not equivalent to the definition in the '988 patent because it is less precise, see, e.g., Hearing Transcript at 161, lns. 11-16, and this Court has no reason to believe that Plaintiff's construction would require any less explanation to a jury than the definition provided on the face of the '988 patent. The Court notes that, at trial, Plaintiff would be permitted to explain to a jury various means of understanding uniaxial anisotropy, much as it did for the Court during its technology tutorial.

Defendants' proposed constructions, also shown above, largely mirror the definition in the '988 patent. Defendants' minor additions to the patent's definition are unnecessary to completely and unambiguously construe the meaning of the term "uniaxial."

4. *Symmetry broken structure*⁹

The Court finds that the appropriate construction of "symmetry broken structure," the fourth disputed claim term, is "a structure consisting of unequal volumes or unequal amounts of the bcc-d variants of a six variant system."

The parties' proposed constructions are as follows:

⁹ This term appears in asserted claims 1, 17 and 27.

Claim Term	Lambeth's Proposal	Seagate's Proposal	Western Digital's Proposal	Toshiba's Proposal [action dismissed]
Symmetry broken structure	A structure consisting of unequal amounts of the bcc-d variants of a six variant system. ^{FN} ^{FN} The structure need not have all six of the bcc-d variants present in order to satisfy this claim term.	A structure of unequal volumes of bcc-d variants of the six variant system.	A structure of unequal volumes of bcc-d variants of the six variant system.	A structure consisting of unequal amounts of the bcc-d variants of a six variant system. ^{FN} ^{FN} The structure need not have all six of the bcc-d variants present in order to satisfy this claim term.

As is apparent from the chart above, the dispute here centers on whether a structure must contain unequal “amounts” or unequal “volumes” of the bcc-d variants in order to be a “symmetry broken structure” within the meaning of the ‘988 patent.

The Court finds that the appropriate construction allows for both possibilities. The patent is imprecise in how it uses the words “volume” and “amount,” using them interchangeably in the context of describing the relationship between crystal variants and symmetry. Compare ‘988 patent col. 23, lns. 26-28 (“These coupled variant sets do not have to be equally weighted in *volume* in the sample.”) (emphasis added), and id. at col. 23, lns. 45-47 (“we have only discussed at length the cases where the variants of a coupled set of variants are equally weighted (balanced) in *volume* of material”) (emphasis added), and id. at col. 23, lns. 61-64 (“the energy density difference between the minimum and the maximum would be decreased by the relative difference in *volume* of materials”), with id. at col. 23, lns. 38-41 (“A crystallographically ‘symmetry broken’ material is defined to exi[s]t when individual, variant sets do not contain an equal *amount* of all six of the (110) textured bcc-d variants.”) (emphasis added), and id. at col.

23, lns. 58-61 (“If the *quantity* of material for this pair is slightly greater than the other four variants then this would break the symmetry and uniaxial behavior would result.”) (emphasis added). Although the ‘988 patent’s definition of “symmetry broken” material uses the word “amount” rather than “volume,” id. at col. 23, ln. 40, the immediate context makes clear that both words are used interchangeably.

The Court therefore finds that it should not construe the disputed claim term in a way that would restrict its meaning to specify either amount or volume. Where the patent itself failed to be so precise, the Court will not read into the patent any such limits. See Phillips, 415 F.3d at 1323.

Plaintiff and Toshiba propose adding a clarifying footnote to the construction of “symmetry broken structure” in order to note that such a structure need not contain all six of the bcc-d variants. The Court agrees that the ‘988 patent describes symmetry broken structures with fewer than all six of the variants and thus agrees that a symmetry broken structure may have fewer than all six of the bcc-d variants. E.g., ‘988 patent at col. 42, lns. 44-60 (describing use of a “hexagonal template” and a “symmetry breaking mechanism” to generate “four-element variant sets with uniaxial behavior”). The Court finds, however, that the construction language “unequal volumes or unequal amounts of the bcc-d variants” logically includes the cases in which “zero” is the quantity of one or more of the variants in the six variant system (so long as the structure meets the requirement of inequality). As a result, the proposed addition to the construction would be superfluous.

5. *Uniaxial symmetry broken structure*¹⁰

Having construed “uniaxial” and “symmetry broken structure,” the Court must now construe the fifth disputed claim term, “uniaxial symmetry broken structure.” The parties’ proposals are provided below:

Claim Term	Lambeth’s Proposal	Seagate’s Proposal	Western Digital’s Proposal	Toshiba’s Proposal [action dismissed]
“Uniaxial symmetry broken structure”	A structure consisting of unequal amounts of the bcc-d variants of a six variant system and that has a single magnetic easy axis and a single hard axis within a 180 degree rotation.	A structure that is uniaxial as a result of the structure being symmetry broken.	A structure that is uniaxial as a result of the structure being symmetry broken.	A structure that is uniaxial as a result of the structure being symmetry broken.

Beyond the disputes this Court resolved, above, in construing “uniaxial” and “symmetry broken structure,” lies an additional dispute: whether this claim term requires that the structure be uniaxial “as a result of” being symmetry broken, as Defendants propose, or whether these two conditions need not be causally connected, as Plaintiff proposes. Because the specification discloses that the entire purpose of the patented invention is the creation of a uniaxial structure through a method of symmetry breaking, the Court finds that this claim term requires that the structure be uniaxial as a result of being symmetry broken.

¹⁰ This term appears in asserted claims 1, 17 and 27.

Crucially, the Court discerns that the desirable property that distinguishes the patented invention from the prior art is its ability to yield a crystal structure with uniaxial magnetic anisotropy. See ‘988 patent at col. 12 ln. 66 – col. 13 ln. 8 (describing “the present invention” as one “to achieve uniaxial magnetocrystalline orientation” and stating that “the invention of orientation control . . . allows new devices to be constructed, which have good orientation, high magnetization, high permeability and low losses.”). This ability is described throughout the ‘988 patent as being caused by the symmetry breaking method. E.g., ‘998 patent at col. 22, lns. 35-66 (describing the “symmetry breaking mechanisms to cause orientation” such that, under the right “processing conditions,” one can “achieve a uniaxial magnetic behavior”); id. at col. 31, lns. 1-3 (“uniaxial behavior is obtained by utilizing the symmetry broken structure”); id. at col. 42, lns. 22-25 (“To achieve uniaxial behavior via the symmetry breaking method requires proper orientation of the template and deposition direction.”).

The extrinsic evidence lends further support to this understanding of the invention. During the inventor’s prosecution of the equivalent patent in the European Union, the inventor responded to an initial rejection by clarifying that “the ‘symmetry breaking mechanism’ selects the variant subset . . . that results in ‘uniaxial’ magnetic behavior.” EP1435091 File History: Patentee’s Response (6/15/10) (Civil Action No. 16-538, Doc. 56-8 at 8-9).

It is apparent that the inventor’s method for growing crystal variants in order to produce uniaxial properties constitutes the fundamental feature of the invention. In light of the specification’s consistent emphasis on the causal relationship between symmetry breaking and uniaxial properties, the Court will incorporate a causal relationship into its construction. See Praxair, 543 F. 3d 1324. The Court thus finds that the appropriate construction of “uniaxial

symmetry broken structure” is “a structure that is uniaxial as a result of the structure being symmetry broken.”

6. *Variant/Orientational Variant and Variants/Orientational Variants*¹¹

The Court finds that the appropriate construction of “variant/orientational variant” is “one of a set of possible crystal orientations” and the appropriate construction of this term’s plural, “variants/orientational variants,” is “two or more of a set of possible crystal orientations.”

The parties’ proposed constructions of the sixth disputed claim term are below:

Claim Term	Lambeth’s Proposal	Seagate’s Proposal	Western Digital’s Proposal	Toshiba’s Proposal [action dismissed]
“Variant/orientational variant”	One of a set of possible crystal orientations.	A bcc-d (110) crystal with a $\langle 100 \rangle$ direction (i) in the (110) plane and (ii) located at one of six angles relative to the $\langle 110 \rangle$ direction of the hexagonal template grain directing the growth of the bcc-d crystal: {-- $\langle \text{formula} \rangle$ --}	Crystal(s) for which one of the bcc-d $\langle 111 \rangle$ directions lies parallel to one of the hexagonal template $\langle 110 \rangle$ directions and for which the bcc-d $\langle 100 \rangle$ direction does not lie parallel to the $\langle 110 \rangle$ hexagonal template.	An in-plane orientation of an overlying crystal structure relative to an underlying structure.
“Variants/orientational variants”	Two or more of a set of possible crystal orientations.	A bcc-d (110) crystal with a $\langle 100 \rangle$ direction (i) in the (110) plane and (ii) located at one of six angles relative to the $\langle 110 \rangle$ direction of the hexagonal template grain	Crystal(s) for which one of the bcc-d $\langle 111 \rangle$ directions lies parallel to one of the hexagonal template $\langle 110 \rangle$ directions and for which the bcc-d $\langle 100 \rangle$ direction does not lie	Different in-plane orientations of an overlying crystal structure relative to an underlying crystal structure.

¹¹ This term appears in asserted claim 8.

		directing the growth of the bcc-d crystal: {--<formula>--}	parallel to the <110> hexagonal template.	
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In every usage within the '988 patent, immediate context indicates that “variant” and “orientational variant” refer to one of a set of possible crystal structures that are defined by their orientation. E.g., '988 patent at col. 10, lns. 39-41 (“there are three ways (variants) for the bcc Cr (110) plane to orient on this . . . surface”); id. at col. 11, lns. 15-16 (“one or two of the three possible orientational variants might grow on a given grain”); id. at col. 13, lns. 39-42 (“FIG. 5 shows an illustration of two of the six possible orientational variants of the (110) crystal plane”); id. at col. 12, lns. 48-52 (“By carefully controlling the epitaxial growth conditions . . . the applicant has invented a new set of six crystalline variants with special orientational relationships). The remaining Defendants propose restricting the meaning of “variant” to refer to only the crystal orientations that are most closely connected to the invention. This definition would exclude, or make unintelligible, numerous examples in the patent in which the word “variant” refers to possible crystal orientations other than those indicated by Defendants. E.g., id. at col. 10, lns. 39-41; id. at col. 11, lns. 15-16. Accordingly, the Court adopts Plaintiff’s construction of “variant(s)” and “orientational variant(s).”

IT IS SO ORDERED.

October 18, 2017

s/Cathy Bissoon
Cathy Bissoon
United States District Judge

cc (via ECF email notification):

All Counsel of Record